



UNITED STATES PATENT AND TRADEMARK OFFICE

CW

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,375	01/04/2002	Jae Hong Kim	30205/37916	9238

4743 7590 01/07/2004

MARSHALL, GERSTEIN & BORUN LLP
6300 SEARS TOWER
233 S. WACKER DRIVE
CHICAGO, IL 60606

EXAMINER

SARKAR, ASOK K

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 01/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/038,375

Applicant(s)

KIM ET AL.

Examiner

Asok K. Sarkar

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-13 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-13 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3 and 5 – 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu, US 6,491,837.

Regarding claim 1, Liu teaches a polishing slurry comprising:

- an oxidant (co-oxidizer) consisting essentially of ceric ammonium nitrate (column 4, line 27 and line 38);
- an abrasive containing essentially of inorganic particles in column 4, lines 1 - 5; and
- an acid selected from the group of HNO_3 , H_2SO_4 , HCl and H_3PO_4 and mixtures thereof in column 4, lines 19 – 20. Liu teaches HNO_3 (also as an oxidizer) in column 4, line 15 thereby making the oxidizer part of the acid and the co-oxidizer the only oxidant.
- wherein the slurry is free of corrosion inhibitors

Regarding claim 3, Liu teaches ceric ammonium nitrate agent is present within the range of 1 – 4 wt% in column 4, lines 40 – 41.

Regarding claim 5, Liu teaches HNO_3 is present from 1 – 7.5 wt% of the slurry in column 4, lines 22 – 23.

Regarding claim 6, Liu teaches inorganic particles of the abrasive are selected from a group consisting of CeO_2 particles and Al_2O_3 particles and ZrO_2 particles in column 4, lines 2 – 4.

Regarding claim 7, Liu teaches size of the abrasive particles is below 1 micron in column 4, lines 1 – 5.

Regarding claim 8, Liu teaches abrasive particles amount of 1 – 5 wt% in column 3, line 66.

Regarding claim 9, Liu teaches pH of the slurry in the range of 1 - 5 in column 5, line 1.

Regarding claim 10, Liu teaches pH of the slurry to be 1 – 3 in column 5, line 1.

Regarding claim 11, Liu teaches slurry comprising a buffer solution in column 4, line 63.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 5, 6, 8 – 13 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Sinha, US 6,551,935 in view of Hellring, US 6,656,241.

Regarding claim 1, Sinha teaches a polishing slurry comprising:

- an oxidant (oxidizer) consisting essentially of ceric ammonium nitrate (column 3, line 12 and column 5, line 39);
- an abrasive containing essentially of inorganic particles in column 5, lines 13 and column 6, lines 1 – 5; and
- an acid selected from the group of H_3PO_4 and H_2SO_4 and mixtures thereof in column 6, lines 19 – 20. Sinha teaches HNO_3 (also as an oxidizer) in column 11, line 7.

Sinha fails to teach slurry free of corrosion inhibitors. Sinha uses the CMP slurry to polish copper, which requires corrosion inhibitors.

Hellring teaches a polishing slurry where he teaches that corrosion inhibitor is an optional additive and needed to optimize the slurry performance for specific CMP applications such as removal of specific metals in column 14, lines 10 – 14.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Sinha's slurry by omitting the corrosion inhibitors sine the slurry will be used for polishing a noble metal Ru, which does not require any corrosion inhibitor during the polishing process.

Additionally, it has been determined that the omission of an element with a consequent loss of its function from a known composition is not patentable. *In re Wilson*, 153 USPQ 740.

Regarding claim 3, Sinha teaches ceric ammonium nitrate agent is present within the range of 1 – 10 wt% in column 5, lines 41 - 42.

Regarding claim 5, Sinha teaches HNO_3 is present from 1 – 10 wt% of the slurry in claim 35 in column 11, lines 10 - 11.

Regarding claim 6, Sinha teaches inorganic particles of the abrasive are selected from a group consisting of CeO_2 particles and Al_2O_3 particles and mixtures thereof in column 6, lines 1 – 5.

Regarding claim 8, Sinha teaches abrasive particles amount of 1 – 5 wt% in column 6, lines 1 – 5.

Regarding claim 9, Sinha teaches pH of the slurry in the range of 3 - 7 in column 6, lines 6 – 7.

Regarding claim 10, Sinha teaches pH of the slurry to be 3 in column 6, lines 6 – 7.

Regarding claim 11, Sinha teaches slurry comprising a buffer solution (pH control agents) in column 6, line 15.

Regarding claim 12, Sinha teaches buffer solution comprising a mixture of organic acid and organic acid salt column 6, lines 15 – 21. Buffer solutions are inherently equimolar mixture of weak acids and their salts.

Regarding claim 13, Sinha teaches buffer solution comprising a mixture of acetic acid and ammonium acetic acid salt column 6, lines 15 – 21.

Regarding claim 24, Sinha teaches a polishing slurry comprising:

- a single oxidant (oxidizer) consisting essentially of ceric ammonium nitrate (column 3, line 12 and column 5, line 39); and
- an abrasive containing essentially of inorganic particles in column 5, lines 13 and column 6, lines 1 – 5.

Sinha fails to teach slurry free of corrosion inhibitors. Sinha uses the CMP slurry to polish copper, which requires corrosion inhibitors.

Hellring teaches a polishing slurry where he teaches that corrosion inhibitor is an optional additive and needed to optimize the slurry performance for specific CMP applications such as removal of specific metals in column 14, lines 10 – 14.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Sinha's slurry by omitting the corrosion inhibitors since the slurry will be used for polishing a noble metal Ru, which does not require any corrosion inhibitor during the polishing process.

Additionally, it has been determined that the omission of an element with a consequent loss of its function from a known composition is not patentable. *In re Wilson*, 153 USPQ 740.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha, US 6,551,935 in view of Hellring, US 6,656,241 as applied to claim 1 above, and further in view of Yano, US 6,375,545.

Sinha in view of Hellring fails to teach the size of the abrasive particles.

Yano teaches a CMP slurry where he teaches size of the abrasive particles is below 1 micron in column 11, lines 50 – 52 so that the inorganic particles do not nick the wafer during polishing in column 12, lines 31 - 41.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Sinha's slurry by controlling the size of the abrasive particles to below 1 micron so that the abrasives do not nick the wafer as taught by Yano in column 12, lines 31 - 41.

Double Patenting

6. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

7. Claims 1, 3, 5 – 13 and 24 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1, 3, 5 – 13 and 29 of copending Application No. 10/096,266. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Response to Arguments

8. Applicant's arguments filed December 1, 2003 have been fully considered but they are not persuasive.

Applicant's argument in page 4 regarding the preamble giving life and

meaning to the claims is not persuasive since the ruthenium metal is not recited in the main claim languages to breathe life and meaning to the claims in order to be considered for examination purposes.

Moreover, according to the MPEP, if the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also *Rowe v. Dror*, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) ("where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation"); *Kropa v. Robie*, 187 F.2d at 152, 88 USPQ2d at 480 – 81.

Applicant's second argument in page 5 is about Liu's reference regarding the use of two oxidizers and is not persuasive. Liu teaches with reference to Table 1 that a single oxidizer can be used although the polishing rater is diminished. Furthermore, when the primary oxidizer is HNO_3 it can be considered as an acid instead of an oxidizing agent.

Applicant's final argument regarding the double patenting rejection was not withdrawn since the Examiner was unable to verify that the Application No. 10/096,266 has been abandoned.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.**

See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

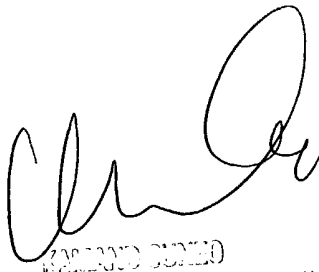
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 703 308 2521 (after 1/13/2004 the number will be 571 272 1970). The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 703 308 1233. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308 7722 (after 1/13/2004 the number will be 571 272 1957) for regular communications and 703 308 7722 for After Final communications.

Art Unit: 2829

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 4918.

Asok K. Sarkar
December 22, 2003



MAILED 0000
SUPERVISOR/INVENTOR
10/038,375/10/038,375